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Quality of Life and Treatment-Related Side Effects in Patients With HR+/HER2– Advanced Breast Cancer: Findings From a Multicountry Survey

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Abstract

Background: Quality of life (QOL) is a critical factor in decision-making for advanced breast cancer (ABC). There is a need to improve how QOL and treatment-related side effects (SEs) that impact it are clinically assessed. We examined healthcare professionals' (HCPs') and patients' perspectives on the importance of QOL discussions and the impact of SEs on QOL in clinical settings.

Patients and Methods: A cross-sectional online survey was conducted (7/2020-5/2021) among oncologists, nurses, and patients with HR+/HER2– ABC in 7 countries.

Results: The survey was completed by 502 HCPs and 467 patients. Overall, 88% of oncologists and 49% of patients recalled QOL discussions at follow-up. In the first- through fourth-line (1L, 2L, 3L, and 4L) settings, respectively, 48%, 57%, 79%, and 85% of oncologists reported QOL was very important; 73% and 45% of patients receiving 1L and 2L treatment and 40% receiving 3L+ treatment indicated QOL was important. Patients reported that insomnia, anxiety, back pain, fatigue, diarrhea, hot flashes, low sexual interest, and loss of appetite had a moderate/severe impact on QOL. Of patients experiencing certain SEs, ≥64% did not discuss them with HCPs until there was a moderate/severe impact on QOL. In patients receiving a CDK4/6 inhibitor, SEs, including insomnia, diarrhea, back pain, and fatigue, had a moderate/severe impact on QOL.

Conclusions: This survey discovered disconnects between HCPs and patients with ABC on the importance of QOL discussions and the impact of SEs on QOL. These data support the use of ABC-specific QOL questionnaires that closely monitor SEs impacting QOL.

Key words: quality of life; advanced breast cancer; survey; qualitative research; physician/patient communication.

Implications for Practice

This real-world survey conducted in clinics across multiple countries found many differences in perceptions between healthcare professionals (oncologists and oncology nurses) and patients with advanced breast cancer regarding their quality of life (QOL) and the side effects that impact it during treatment. These findings show the need to enhance communication between healthcare professionals and patients for improved shared decision-making during treatment planning, keeping in mind side effects, including insomnia, anxiety, back pain, fatigue, and diarrhea, which were found to have a moderate to severe impact on the QOL of patients with advanced breast cancer in this survey.

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Introduction

Breast cancer is the most frequently diagnosed cancer (24.5%) among women worldwide, with the hormone receptor-positive, human epidermal growth factor receptor 2-negative (HR+/HER2–) subtype being the most common subtype (≈73% of cases in the US).[1,2] Patients with metastatic or advanced breast cancer (ABC) have a lower quality of life (QOL) than patients with early-stage breast cancer, and it further deteriorates as the disease progresses.[3-6] Although many treatments are available, the combination of a CDK4/6 inhibitor (CDK4/6i; ribociclib, palbociclib, or abemaciclib) plus endocrine therapy (ET) has demonstrated significant improvements in progression-free survival in phase III clinical trials of pre- and post-menopausal patients with HR+/HER2– ABC.[7-11] As such, CDK4/6is are now the preferred first-line treatment option for these patients.[12] In addition, ribociclib has demonstrated significant improvements in overall survival (OS) in patients with HR+/HER2– ABC in the first- and second-line settings; abemaciclib has demonstrated an OS benefit in patients treated in the second-line setting; results in the first-line setting are still immature, and palbociclib has failed to show an OS benefit in any ABC setting.[13-20] These CDK4/6is are also associated with differences in safety profiles and QOL outcomes in this patient population.[5,21-26] Thus, along with treatment efficacy, understanding the impact of treatment-related side effects on QOL is critical; the European Society of Medical Oncology Magnitude of Clinical Benefit Scale (ESMO-MCBS) was created to help guide clinical decision-making with these factors considered.[27-29]

To better understand the patient perspective, trials have incorporated patient-reported outcome measures (PROMs) to evaluate the benefits and risks of various study treatments.[21,22,24] It is important to note, however, that QOL evaluation in trials using PROMs has limitations, given a set of restricted inclusion and exclusion criteria and data collection in a controlled setting through standardized QOL questionnaires. Additionally, many clinical trials use generic PROMs instead of disease-specific PROMs, which do not capture changes in patients' QOL relative to the treatment of their specific disease.[30] Therefore, generalizing these data to real-world patients with ABC is challenging.

In a real-world clinical setting, QOL discussions between patients with ABC and their healthcare professionals (HCPs) are essential for making informed treatment decisions. However, evidence related to the perceptions of HCPs and patients on discussions around QOL and treatment-related side effects in clinical practice is sparse.[29,31,32] This study was conducted to understand the perspectives of HCPs and patients with ABC on QOL, treatment-related side effects and their impact on QOL, and the relative importance of related discussions in real-world clinical settings.

Materials and Methods

An online survey was designed by a steering committee of oncologists, oncology nurses, patient advocates, and patients with HR+/HER2– ABC. It was approved by an ethics committee (Western IRB; 13022771) for deployment among HCPs and patients with HR+/HER2– ABC. All participants provided informed consent to take part in the study.

Study Design

Data were collected between July 2020 and May 2021 via a cross-sectional online survey of 502 HCPs (277 oncologists; 225 oncology nurses) and 467 patients with HR+/HER2– ABC in 7 countries (Australia, Brazil, Egypt, Germany, Italy, South Korea, and the US; Supplementary Table S1). Recruitment of HCPs was undertaken by a third-party panel, and patients with HR+/HER2– ABC were recruited by physicians who took part in the survey and patient organizations. Treatment history and demographic information were collected from patients (self-reported) for screening purposes to determine eligibility to participate in the survey. HCPs were surveyed on ABC management, including the importance of QOL, how it is assessed in clinical practice, and the side effects that they thought impacted their patients' QOL during treatment. Patients were surveyed on the importance of their QOL, the frequency of QOL discussions with HCPs, and side effects that they believed impacted their QOL while undergoing ABC treatment. Patients were asked to think about overall QOL in the context of their current experience of living with and receiving treatment for ABC, as well as their physical, mental, emotional, and social well-being. All survey observations were assessed using a 4-point Likert scale. The survey questions included levels of agreement scales: "completely agree," "moderately agree," "slightly agree," and "do not agree." Levels of the impact of side effects on QOL were captured as "no impact," "mild impact," "moderate impact," or "severe impact." The data were analyzed descriptively.

Participants

The oncologists included in the survey were required to have a minimum caseload of 5 patients with HR+/HER2– ABC in the last 6 months. They were also required to be the HCP responsible for making treatment decisions for these patients, as many survey questions for HCPs focused on whether QOL factors were considered in treatment planning. Oncology nurses with a minimum direct patient contact time of 50% and those who regularly educated patients about their ABC or had discussions with patients on QOL were included to participate in the survey. Patients included in the survey were aged ≥18 and <75 years, diagnosed with HR+/HER2– ABC (stages IIIb or IV) in the last 5 years, and currently receiving an aromatase inhibitor, a selective estrogen receptor modulator or selective estrogen receptor degrader, or a CDK4/6i. Patients who were currently part of any clinical trial of anticancer medications did not qualify for the survey.

Results

HCP and Patient Characteristics

A total of 502 HCPs participated in the survey (277 oncologists; 225 oncology nurses; Supplementary Table S1A). Most HCPs worked in a university hospital (31%) or a community hospital (24%) or had their own private practice (25%). Of the oncologists who participated in the survey, 61% were male, and almost all oncology nurses (92%) were female.

A total of 467 patients with HR+/HER2– ABC participated in the survey. Approximately half of the patients had locally advanced breast cancer (stage IIIb), and the other half had metastatic breast cancer (stage IV; Supplementary Table S1B). The mean patient age was 49.6 years. Most

patients were female and premenopausal. Approximately half of the patients had 1 or 2 lines of treatment since diagnosis with ABC.

QOL Discussions at Follow-Up Visits

When asked about QOL-related discussions at follow-up visits, 88% of oncologists responded that they discuss QOL with their patients with ABC. Of the oncology nurses, 96% responded affirmatively when asked the same question (Fig. 1A). Similarly, 89% of oncologists and 92% of nurses responded that they ask their patients about QOL while making or supporting treatment decisions (Fig. 1A). Of 459 patients, 49% reported that their oncologist always or very often asks about QOL, while 34% responded that their oncologist never asks about QOL at follow-up appointments. There was even more disparity among responses by nurses and patients; while only 32% of patients reported that their nurses always or very often ask about QOL at follow-up appointments, 56% responded that their nurses never ask about QOL at follow-up appointments (Fig. 1B).

QOL Discussions at Different Lines of Therapy

A higher percentage of oncologists reported that QOL was very important in making treatment decisions for patients receiving later versus earlier lines of therapy. Of 277 oncologists, 48% responded that QOL was very important in the first-line (1L) setting; 57%, 79%, and 85% of oncologists reported that QOL was very important in the second-line (2L), third-line (3L), and fourth-line settings, respectively (Fig. 2A). Conversely, with each subsequent line of therapy, fewer patients reported that QOL was an important factor in making treatment or management decisions related to their ABC. Of the 142 patients receiving treatment in the 1L setting at the time of the survey, 73% completely agreed that QOL should be considered during treatment decisions; this percentage decreased to 45% in patients in the 2L setting (n = 116) and 40% in the 3L+ setting (n = 209; Fig. 2B). Although many oncologists believed that QOL was important in later lines of treatment, patients receiving later lines were more likely to report never being asked about QOL at follow-up appointments with their oncologists. Of the 140 patients in the 1L setting, 18% reported never being asked about QOL at

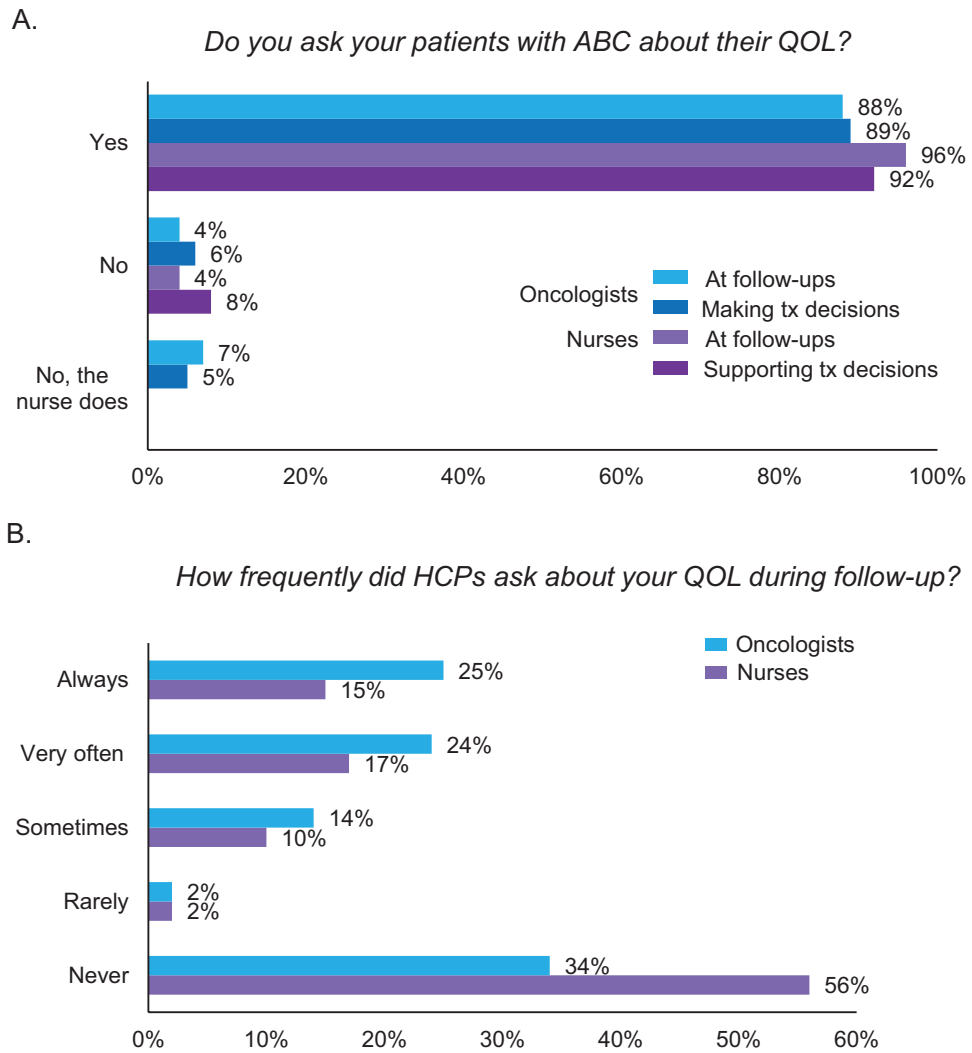

Figure 1. (**A**) HCP and (**B**) patient responses to survey questions on the frequency of QOL discussions at follow-up appointments. Abbreviations: ABC, advanced breast cancer; HCP, health care professional; QOL, quality of life; tx, treatment.

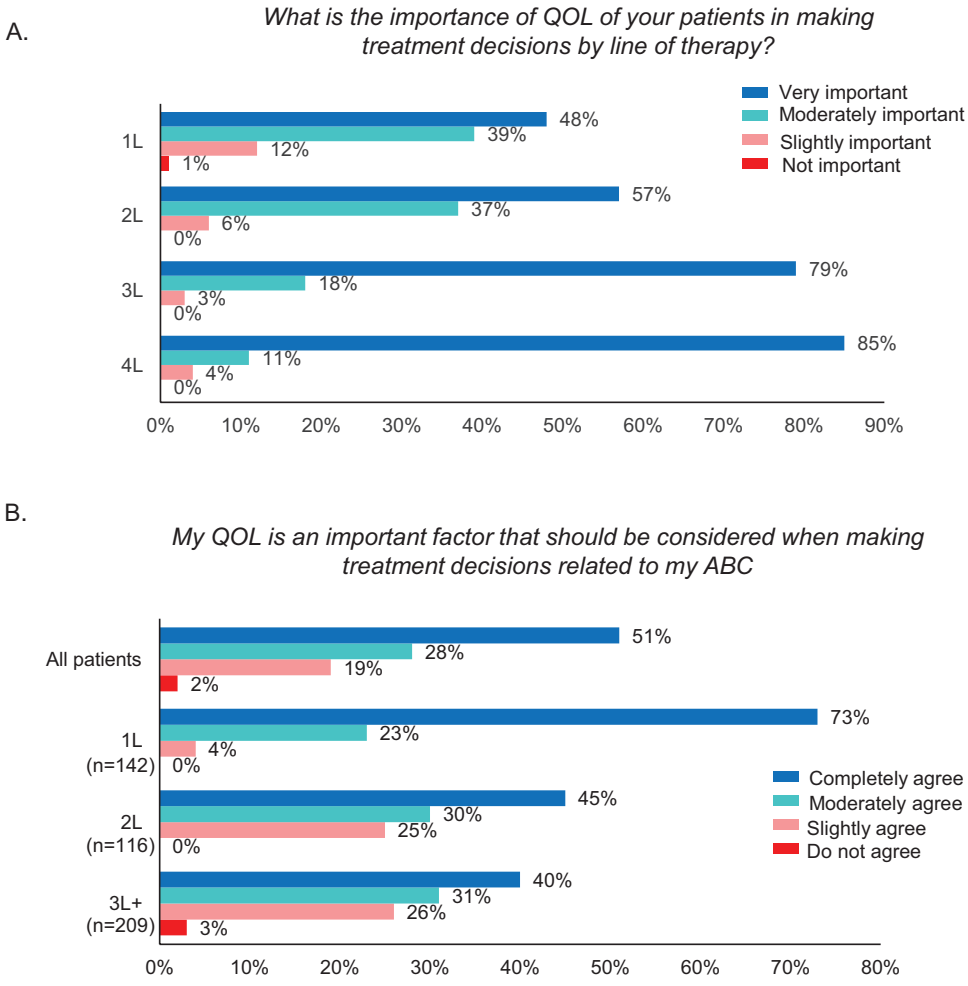

Figure 2. (**A**) HCP and (**B**) patient responses by line of therapy regarding the importance of QOL in making treatment decisions. Abbreviations: 1L, first line; 2L, second line; 3L, third line; 4L, fourth line; ABC, advanced breast cancer; HCP, health care professional; QOL, quality of life.

follow-up appointments; this percentage increased to 39% in the 2L setting (n = 113) and 43% in the 3L+ setting (n = 206).

QOL Discussions on Side Effects

Of the 467 patients who participated in the survey, 82% of patients experienced ≥1 moderate- or severe-grade side effect since the start of their current treatment; 7% of patients reported no side effects. Overall, 67% of patients experienced ≥3 side effects since the start of their current treatment, and 20% experienced ≥5 side effects.

Patients with ABC (n = 467) and HCPs (n = 502) mostly agreed on side effects that severely impacted QOL. Most patients (78%) and HCPs (98%) surveyed believed that side effects that affected day-to-day activities had a moderate or severe impact on patients' QOL. Likewise, 76% of patients and 92% of HCPs noted that fear of disease progression had a moderate or severe impact on patients' QOL. Most patients (73%) and HCPs (96%) believed that pain had a moderate or severe impact on QOL.

The divergence between HCP and patient perceptions was more apparent for milder side effects. Compared with only 40% of HCPs (n = 502), 78% of patients who experienced mild fatigue (relieved by rest; n = 190) reported that it had a moderate or severe impact on QOL. Contrastingly, a much higher percentage of HCPs (94%) and 75% of patients who experienced severe fatigue (not relieved by rest; n = 97) reported that it had a moderate or severe impact on QOL.

The most common side effects experienced by patients (n = 467) since starting their ABC treatment were fatigue (73%), pain (64%), hot flashes (58%), low sexual interest (58%), loss of appetite (52%), insomnia (51%), anxiety (51%), and diarrhea (45%). Of patients who experienced side effects, a majority reported that insomnia (83%), anxiety (82%), back pain (78%), fatigue (77%), diarrhea (71%), hot flashes (64%), low sexual interest (64%), and loss of appetite (60%) had a moderate or severe impact on their QOL (Fig. 3A). Most patients waited until a side effect (anxiety, 80%; fatigue, 79%; pain, 74%; diarrhea, 73%; loss of appetite, 73%; insomnia, 72%; low sexual interest, 67%; and hot flashes, 64%) moderately impacted QOL before discussing the issue with their HCP (Fig. 3B).

Reasons that patients may be hesitant to discuss side effects with HCPs were also surveyed. Of the 96 patients who reported that they did not discuss side effects with their HCPs, 40% reported that they were not directly asked about them, or they believed that the side effect did not impact their daily routine (37%). Other reasons included not wanting to potentially change an effective treatment (28%) and believing that the side effect was unrelated to their treatment (16%).

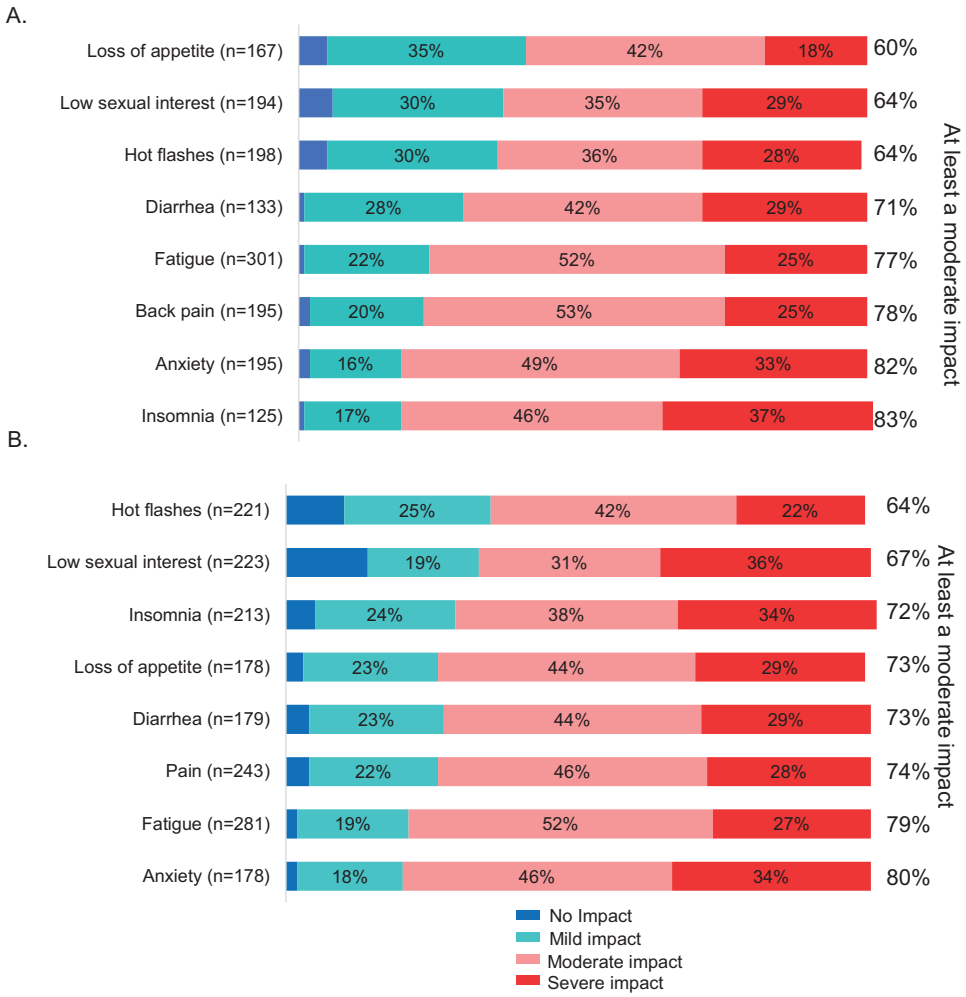

Figure 3. Patient responses on (**A**) side effects with a moderate or severe impact on QOL and (**B**) the level of impact experienced before discussing the side effect with their HCPs. Abbreviations: HCP, health care professional; QOL, quality of life.

The survey also looked at which side effects patients were most likely to discuss with HCPs and with what type of HCP. If they experienced fatigue (one of the most common side effects reported by patients, n = 281), 77% discussed it with their oncologists; 34% noted they discussed it with their primary care physician, and 33% discussed it with their oncology nurse. Of patients who experienced pain (n = 243), the second most common side effect, 72% discussed it with their oncologists; 31% discussed it with their primary care physician, and 32% discussed it with their oncology nurse. Many patients experienced low sexual interest (n = 223), anxiety (n = 178), and insomnia (n = 213), but 26%, 15%, and 10% of these patients, respectively, did not discuss these side effects with any HCPs.

Side Effects Impacting QOL in Patients Receiving CDK4/6is

The side effects experienced by patients who were receiving CDK4/6is (n = 96) included fatigue (54%), low sexual interest (50%), loss of appetite (41%), back pain (38%), hot flashes (36%), anxiety (34%), diarrhea (25%), and insomnia (14%). Additionally, 83% of patients receiving a CDK4/6i experienced ≥1 moderate or severe side effect (Fig. 4A). Some side effects had a moderate or severe impact on QOL in a large percentage of patients; 85% of patients who experienced insomnia, 75% of patients who experienced diarrhea or back pain, and 74% of patients who experienced fatigue reported a moderate or severe impact of these side effects on QOL (Fig. 4B).

QOL Assessment Questionnaires

When HCPs were questioned on how they asked their patients about QOL, 97% of oncologists (n = 259) and 88% of oncology nurses (n = 222) reported that that they asked them verbally using their own question(s). Few oncologists (11%) and a slightly higher percentage of oncology nurses (30%) reported using formal QOL questionnaires during the appointment or being completed at home after the appointment (paper and pencil or electronic) by patients (oncologists, 5%; oncology nurses, 7%).

All HCPs were asked about routine assessments of QOL; only 19% completely agreed that they had enough time to discuss QOL with patients. Regarding the accessibility of QOL tools, only 14% of HCPs completely agreed that they have tools available to help them assess QOL. Furthermore, only 11% of HCPs completely agreed that the available QOL questionnaires are specific enough to be customizable to each patient. Finally, only 12% of HCPs reported that they have

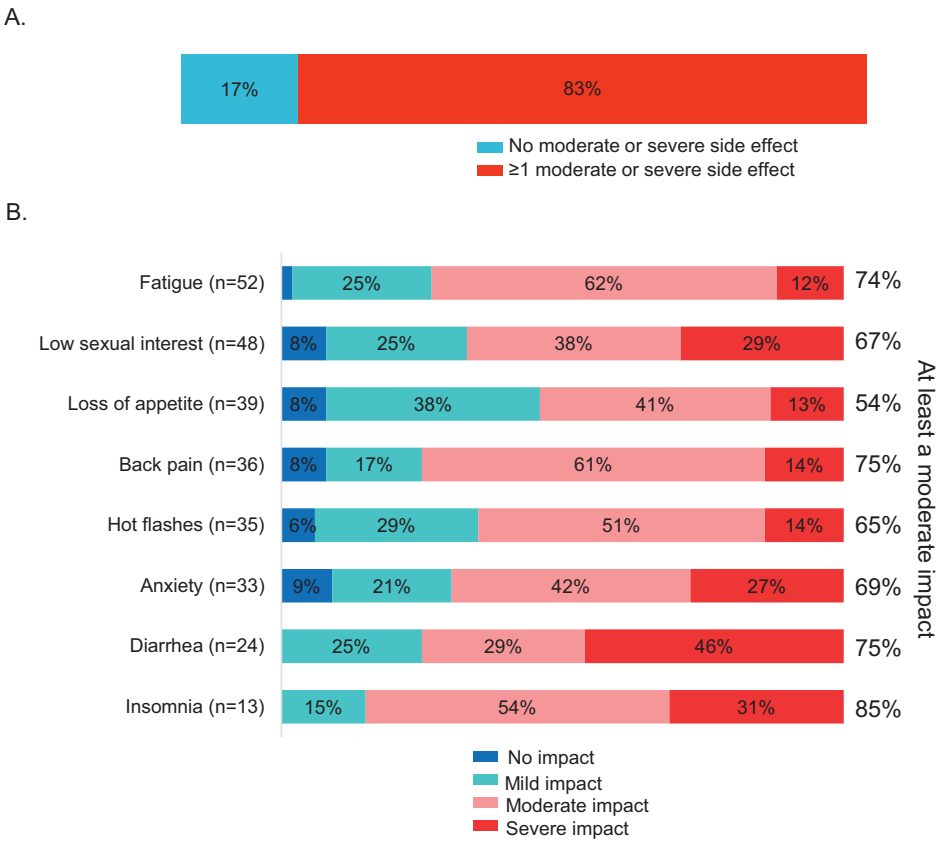

Figure 4. (**A**) Frequency and severity of side effects and (**B**) the impact of each side effect on QOL as reported by patients receiving CDK4/6is. Abbreviation: QOL, quality of life.

access to QOL questionnaires that are integrated with electronic health record systems in their clinic (Supplementary Fig. S1).

Familiarity with available QOL tools was also poor among oncologists (n = 277) with 25% of them completely agreeing with the statement "I am able to interpret QOL results from clinical trials in a way that enables me to make decisions in my practice." Of the oncologists who were familiar with QOL tools used in ABC clinical trials (n = 204), only 7% completely agreed that these tools were able to accurately reflect a patient's QOL, and 10% completely agreed that QOL tools capture QOL improvements when treatments delay disease progression.

Discussion

This real-world, multicountry survey found several divergent perceptions between patients with HR+/HER2– ABC and HCPs (oncologists and oncology nurses) regarding the assessment of QOL and the side effects impacting it in clinical practice. Overall, patients and HCPs differed in their reporting on the frequency and relevance of discussions around QOL in making treatment decisions. These differences were more evident in later lines of therapy. Many patients who experienced the following side effects reported that insomnia (83%), anxiety (82%), back pain (78%), fatigue (77%), diarrhea (71%), hot flashes (64%), low sexual interest (64%), and loss of appetite (60%) had a moderate or severe impact on QOL; however, there was a disconnect between patients and HCPs regarding the impact of a number of side effects on QOL. The survey also found that patients showed hesitancy in discussing the side effects they experienced with their HCPs until they had a moderate or severe impact on their QOL, and HCPs potentially undervalued the impact of mild side effects on QOL.

Additionally, the contrast between patient and HCP perceptions about QOL assessments was more evident in later lines of therapy. The survey found that HCPs believed that QOL discussions were more important in making treatment decisions as the disease progressed and the patient was receiving subsequent lines of therapy, while fewer patients receiving later lines of therapy felt that QOL should be an important consideration in making treatment decisions than patients in earlier lines of therapy. Considering the deterioration in patient QOL as the disease progresses and the increasingly limited number of treatment options available with each line of therapy, HCPs considering later lines of therapy may prefer to focus on QOL while making treatment decisions.[4,5] However, patients with progressive disease may be more willing to tolerate treatment effects on QOL if it means extending their lives.

We also discovered that HCPs may overestimate the impact of some side effects (eg, pain) or undervalue the impact of some side effects (eg, mild fatigue) on QOL compared with patients. Furthermore, patients tended not to discuss side effects with their HCPs until they had at least a moderate impact on QOL. As HCPs may not focus heavily on low-grade side effects of cancer treatment in QOL discussions with patients, and because patients may be hesitant to discuss them or consider them to be less important, HCPs may not be fully aware of the impact of certain side effects on QOL

(eg, persistent mild side effects associated with CDK4/6i use). Digital tools with more involvement from oncology nurses may be useful in these cases.[33,34] For example, electronic self-reported QOL assessment tools can capture and raise awareness of low-grade treatment-related symptoms that may otherwise go unnoticed by HCPs.[33,35] Digital tools advising patients on the reporting of side effects have been shown to increase symptom reports by patients during clinic visits.[33] Furthermore, real-time electronic monitoring of patient-reported symptoms with nurses playing an active part in patient communication has led to more effective HCP-patient communication and improved symptom management.[34,36]

Because CDK4/6is are standard treatments for HR+/HER2– ABC, this survey included questions related to these agents. A prior meta-analysis including 6 phase III clinical trials of CDK4/6is found that side effects such as neutropenia, anemia, fatigue, diarrhea, febrile neutropenia, and nausea were associated with the use of CDK4/6is in patients with ABC.[37] In our survey, we observed that many of these side effects, including insomnia, anxiety, back pain, fatigue, diarrhea, hot flashes, low sexual interest, and loss of appetite, had a moderate or severe impact on QOL in patients receiving a CDK4/6i. It is important to remember that the available CDK4/6is have different side effect profiles that can impact patient QOL in distinctive ways. No data from head-to-head studies exist; however, 2 independent matching-adjusted indirect comparisons (MAICs) demonstrated that these differences in side effect profiles between CDK4/6is have varying impacts on QOL.[38,39] Both found that abemaciclib was associated with significantly greater impact on symptom-related QOL, including appetite loss, diarrhea, and fatigue, compared with palbociclib and ribociclib. Taken together, data from analyses like these MAICs along with patient-HCP discussions and close monitoring of side effects should inform treatment decisions related to the choice of CDK4/6i.

Finally, fewer patients than HCPs recalled having discussions around QOL at follow-up visits in the clinic. Pertinent to this finding, we observed that most HCPs addressed patient QOL using their own questions instead of formal QOL assessment tools. It is important to note that many HCPs may have individualized ways of discussing QOL that are not captured in the survey questions. A 2005-2015 ABC decade report recommended that a more structured definition of QOL was needed for patients to verbalize their needs.[32] Thus, the difference between patient and HCP recall around QOL discussions could be reflective of the language that is used to discuss QOL in the clinic. Previous studies have shown that while oncologists frequently mention QOL factors during consultations, there may be a difference in communication style.[40,41] For example, if HCPs discussed QOL more vaguely, this could potentially leave patients with no perception or memory that QOL was discussed. Importantly, this lack of clarity in QOL discussions could be contributing to our survey results showing even greater disparity in recall of QOL discussions between oncology nurses and patients compared with those between HCPs and patients.

While validated tools for measuring QOL exist, vast heterogeneity exists in instruments used for PROMs in patients with ABC, with many HCPs being unfamiliar with interpreting these tools, which may deter HCPs from using them. The results of this survey support the use of validated questionnaires for assessment of QOL in patients with ABC in the clinical setting.

In summary, the results of this survey suggest that to enhance HCP-patient communication, QOL should be regularly and formally assessed with validated, ABC-specific QOL questionnaires that closely monitor treatment side effects. As time for oncologists to discuss holistic care during visits is limited, any concerns regarding the efficiency of PROMs and the frequency at which they are completed should be addressed. In addition, strategies for capturing QOL impacts outside of appointments should be considered, including electronic PROMs used by the patient in waiting rooms or at home, as well as remote monitoring of QOL. Furthermore, as oncology nurses are more likely to administer QOL surveys to patients, adequate digital tools should be provided to enable consistent and accurate QOL assessment. Finally, breast cancer patient advocacy groups can play a key role in educating patients on treatment-related QOL issues while also raising awareness among HCPs on disease-specific PROMs. Implementation of these measures would allow more robust HCP-patient communications and rapid intervention, when needed, to help prevent or address side effects that could moderately or severely impact QOL among patients with ABC.

Generalizability

The phase III trials of CDK4/6i plus ET in patients with HR+/HER2– ABC, along with the safety and efficacy objectives, included PROMs of health-related QOL as secondary objectives. Incorporation of these measures allowed the assignment of ESMO-MCBS scores to each CDK4/6i plus ET combination for different lines of therapy in the ABC setting to help guide treatment decisions.[5,12,22-26,28] The current analysis adds to the body of knowledge regarding QOL impact on treatments in patients with ABC. It is important to note that patients with HR+/HER2– ABC may have decreased QOL with more severe symptoms compared with those with HR+/HER2– early breast cancer (EBC). Thus, QOL impacts may be more obvious in this setting. The discordance between HCPs and patients regarding mild side effects reiterates the need to determine whether these results are generalizable to the EBC setting. To better understand the impact of side effects on QOL in patients with EBC, there is a need to include PROMs in therapeutic cancer trials in the EBC setting. Thus far, with respect to key trials of CDK4/6is in the EBC setting, monarchE and PENELOPE-B have reported QOL outcomes.[42-44] NATALEE, an ongoing phase III, randomized trial evaluating the efficacy and safety of adjuvant ribociclib plus ET, is also measuring QOL in patients with HR+/HER2– EBC.[45] Once completed, considering QOL data from all of these trials will provide additional guidance for clinical decision-making in EBC.

Conclusion

This survey discovered that many side effects, including insomnia, anxiety, back pain, fatigue, diarrhea, hot flashes, low sexual interest, and loss of appetite, have a moderate or severe impact on the QOL of patients with HR+/HER2– ABC. Further, patients were often reluctant to discuss these side effects with their HCPs. This lack of communication may affect HCPs' and patients' ability to make informed treatment decisions. This shows the need for enhancing HCP-patient communication for shared decision-making while considering the trade-offs between side effects of treatment and QOL.

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Conflict of Interest

Fatima Cardoso reports personal fees for an advisory role from Amgen, Astellas Pharma US, Medivation, AstraZeneca, Celgene Corporation, Daiichi Sankyo, Eisai, GE Oncology, Genentech, GSK, MacroGenics, Medscape, Merck & Co, Inc, Merus, Mylan, Mundipharma International, Novartis, Pfizer, Pierre Fabre group, PRIME Oncology, F. Hoffmann-La Roche, Sanofi, Samsung Bioepis, Teva Pharmaceuticals Industry, Seagen, Gilead Sciences, IQVIA, and Touch Medical Media. Julie Rihani has nothing to disclose. Victoria Harmer reports personal fees for lectures from Lilly, Roche, Bioderma, and Medscape. Nadia Harbeck reports personal fees for consulting and lectures from AstraZeneca, Daiichi Sankyo, Merck & Co, Inc, Pierre Fabre group, F. Hoffmann-La Roche, Sandoz International GmbH/Hexal, Amgen, Exact Sciences Corporation, Gilead Sciences, and Seagen and was codirector for the West German Study Group. Ana Casas has nothing to disclose. Hope Rugo reports institution grants from Plexxikon, Macrogenics, OBI Pharma, Eisai, Pfizer, Novartis, Lilly, GSK, Genentech, CELSION Brandschutzsysteme GmbH, and Merck & Co, Inc; personal fees for travel, accommodations, and expenses from Novartis, Genentech, OBI Pharma, Bayer AG, and Pfizer; and speakers bureau for Genomic Health. Peter Fasching reports personal fees for advisory board from and was an invited speaker for Novartis, Pfizer, Daiichi Sankyo, AstraZeneca, Eisai, Merck & Co, Inc, Lilly, Seagen, F. Hoffmann-La Roche, and Gilead Sciences; personal fees for advisory board from Pierre Fabre group, Hexal, Agendia, and Sanofi; grants for institutional funding from BioNTech and Cepheid; and research grants from Pfizer. Adam Moore reports employment from Adelphi Real World. Joanna de Courcy reports payment from Novartis to institution (Adelphi Real World) for conducting this study. Purnima Pathak, Sina Haftchenary, and Dawn Aubel report employment and stock ownership from Novartis. Eva Schumacher-Wulf has nothing to disclose.

Author Contributions

Conception/design: P.P., S.H., D.A. Provision of study material or patients: A.M., J.d.C. Collection and/or assembly of data: A.M., J.d.C. Data analysis and interpretation: All authors. Manuscript writing and final approval of manuscript: All authors.

Data Availability

Novartis is committed to sharing with qualified external researchers, access to patient-level data and supporting clinical documents from eligible studies. These requests are reviewed and approved by an independent review panel on the basis of scientific merit. All data provided is anonymized to respect the privacy of patients who have participated in the trial in line with applicable laws and regulations.

Supplementary Material

Supplementary material is available at *The Oncologist* online.

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